

CLAIMS

The invention claimed is:

- 5 1. A device comprising:
a network interface for coupling to a network; and
a processor coupled with the network interface, in which the processor is
adapted to
10 receive packets in a first node of a network;
store some of the received packets in a queue;
retransmit some of the stored packets from the queue;
discard some of the received packets when the queue has filled up to a
preset threshold;
15 determine lengths of respective pluralities of episodes of sequentially
discarded packets;
determine a loss length statistic for the first node from at least the
determined lengths; and
incorporate the loss length statistic in a routing table.
- 20 2. The device of claim 1, in which
the loss length statistic is the number of sequentially discarded packets.
3. The device of claim 1, in which
the loss length statistic is an average duration of episodes of sequentially
25 discarded packets.
4. The device of claim 1, in which
the loss length statistic is a variance in a duration of episodes of sequentially
discarded packets.
- 30 5. The device of claim 1, in which
the loss length statistic is a maximum duration of episodes of sequentially
discarded packets.

6. The device of claim 1, in which the processor is further adapted to:
compare the loss length statistic to a preset minimum.

7. The device of claim 1, in which the processor is further adapted to:
compute a figure of merit from the loss length statistic for the first
node.

8. The device of claim 1, in which the processor is further adapted to:
define bad states that correspond to the discarded packets and good
states that correspond to all other received packets;
determine when there are transitions in the sequentially received
packets between the good states and the bad states; and
counting numbers of the transitions,
and in which the lengths are determined from the counted numbers of
transitions.

9. The device of claim 1, in which the processor is further adapted to:
look up a collateral parameter from a table,
and in which the loss length statistic is determined also from the collateral
parameter.

10. The device of claim 9, in which
the collateral parameter is a residual bandwidth.

11. The device of claim 1, in which the processor is further adapted to:
determine a loss length statistic for a second node about packets
discarded at the second node.

12. The device of claim 11, in which the processor is further adapted to:
compare the loss length statistic for the second node to that of the first
node.

13. The device of claim 11, in which the processor is further adapted to:

compare the loss length statistic for the second node to a preset minimum.

14. The device of claim 11, in which the processor is further adapted to:

combine the loss length statistic for the second node with the loss length statistic for the first node to determine an aggregate loss length statistic for a first path.

15. The device of claim 14, in which the processor is further adapted to:

compare the aggregate loss length statistic to a preset minimum.

16. The device of claim 14, in which the processor is further adapted to:

determine an aggregate loss length statistic for a second path.

17. The device of claim 16, in which the processor is further adapted to:

compare the aggregate loss length statistic for the second path to that of the first path.

18. The device of claim 16, in which the processor is further adapted to:

compare the aggregate loss length statistic for the second path to a preset minimum.

19. A device comprising:

means for receiving packets in a first node of a network;

means for storing some of the received packets in a queue;

means for retransmitting some of the stored packets from the queue;

means for discarding some of the received packets when the queue has filled up to a preset threshold;

means for determining lengths of respective pluralities of episodes of sequentially discarded packets;

means for determining a loss length statistic for the first node from at least the determined lengths; and

means for incorporating the loss length statistic in a routing table.

20. The device of claim 19, in which
the loss length statistic is the number of sequentially discarded packets.

21. The device of claim 19, in which
the loss length statistic is an average duration of episodes of sequentially
discarded packets.

22. The device of claim 19, in which
the loss length statistic is a variance in a duration of episodes of sequentially
discarded packets.

23. The device of claim 19, in which
the loss length statistic is a maximum duration of episodes of sequentially
discarded packets.

24. The device of claim 19, further comprising:
means for comparing the loss length statistic to a preset minimum.

25. The device of claim 19, further comprising:
means for computing a figure of merit from the loss length statistic for the first
node.

26. The device of claim 19, further comprising:
means for defining bad states that correspond to the discarded packets and
good states that correspond to all other received packets;
means for determining when there are transitions in the sequentially received
packets between the good states and the bad states; and
means for counting numbers of the transitions,
and in which the lengths are determined from the counted numbers of
transitions.

27. The device of claim 19, further comprising:
means for looking up a collateral parameter from a table,

and in which the loss length statistic is determined also from the collateral parameter.

28. The device of claim 27, in which
the collateral parameter is a residual bandwidth.

29. The device of claim 19, further comprising:
means for determining a loss length statistic for a second node about packets discarded at the second node.

30. The device of claim 29, further comprising:
means for comparing the loss length statistic for the second node to that of the first node.

31. The device of claim 29, further comprising:
means for comparing the loss length statistic for the second node to a preset minimum.

32. The device of claim 29, further comprising:
means for combining the loss length statistic for the second node with the loss length statistic for the first node to determine an aggregate loss length statistic for a first path.

33. The device of claim 32, further comprising:
means for comparing the aggregate loss length statistic to a preset minimum.

34. The device of claim 32, further comprising:
means for determining an aggregate loss length statistic for a second path.

35. The device of claim 34, further comprising:
means for comparing the aggregate loss length statistic for the second path to that of the first path.

36. The device of claim 34, further comprising:

means for comparing the aggregate loss length statistic for the second path to a preset minimum.

37. An article comprising: a storage medium, the storage medium having
5 instructions stored thereon, in which when the instructions are executed by at least one device, they result in:

receiving packets in a first node of a network;

storing some of the received packets in a queue;

retransmitting some of the stored packets from the queue;

10 discarding some of the received packets when the queue has filled up to a preset threshold;

determining lengths of respective pluralities of episodes of sequentially
discarded packets;

15 determining a loss length statistic for the first node from at least the determined lengths; and

incorporating the loss length statistic in a routing table.

38. The article of claim 37, in which
the loss length statistic is the number of sequentially discarded packets.

39. The article of claim 37, in which
the loss length statistic is an average duration of episodes of sequentially
discarded packets.

25 40. The article of claim 37, in which
the loss length statistic is a variance in a duration of episodes of sequentially
discarded packets.

30 41. The article of claim 37, in which
the loss length statistic is a maximum duration of episodes of sequentially
discarded packets.

42. The article of claim 37, in which the instructions further result in:
comparing the loss length statistic to a preset minimum.

43. The article of claim 37, in which the instructions further result in:
computing a figure of merit from the loss length statistic for the first node.

5 44. The article of claim 37, in which the instructions further result in:
defining bad states that correspond to the discarded packets and good states
that correspond to all other received packets;
determining when there are transitions in the sequentially received packets
between the good states and the bad states; and
10 counting numbers of the transitions,
and in which the lengths are determined from the counted numbers of
transitions.

15 45. The article of claim 37, in which the instructions further result in:
looking up a collateral parameter from a table,
and in which the loss length statistic is determined also from the collateral
parameter.

20 46. The article of claim 45, in which
the collateral parameter is a residual bandwidth.

47. The article of claim 37, in which the instructions further result in:
determining a loss length statistic for a second node about packets discarded at
the second node.

25 48. The article of claim 47, in which the instructions further result in:
comparing the loss length statistic for the second node to that of the first node.

30 49. The article of claim 47, in which the instructions further result in:
comparing the loss length statistic for the second node to a preset minimum.

50. The article of claim 47, in which the instructions further result in:

combining the loss length statistic for the second node with the loss length statistic for the first node to determine an aggregate loss length statistic for a first path.

51. The article of claim 50, in which the instructions further result in: comparing the aggregate loss length statistic to a preset minimum.

52. The article of claim 50, in which the instructions further result in: determining an aggregate loss length statistic for a second path.

53. The article of claim 52, in which the instructions further result in: comparing the aggregate loss length statistic for the second path to that of the first path.

54. The article of claim 52, in which the instructions further result in: comparing the aggregate loss length statistic for the second path to a preset minimum.

55. A method comprising:
receiving packets in a first node of a network;
storing some of the received packets in a queue;
retransmitting some of the stored packets from the queue;
discarding some of the received packets when the queue has filled up to a preset threshold;
determining lengths of respective pluralities of episodes of sequentially discarded packets;
determining a loss length statistic for the first node from at least the determined lengths; and
incorporating the loss length statistic in a routing table.

56. The method of claim 55, in which the loss length statistic is the number of sequentially discarded packets.

57. The method of claim 55, in which

the loss length statistic is an average duration of episodes of sequentially discarded packets.

58. The method of claim 55, in which

5 the loss length statistic is a variance in a duration of episodes of sequentially discarded packets.

59. The method of claim 55, in which

10 the loss length statistic is a maximum duration of episodes of sequentially discarded packets.

60. The method of claim 55, further comprising:

comparing the loss length statistic to a preset minimum.

15 61. The method of claim 55, further comprising:

computing a figure of merit from the loss length statistic for the first node.

62. The method of claim 55, further comprising:

20 defining bad states that correspond to the discarded packets and good states that correspond to all other received packets;

determining when there are transitions in the sequentially received packets between the good states and the bad states; and

counting numbers of the transitions,

25 and in which the lengths are determined from the counted numbers of transitions.

63. The method of claim 55, further comprising:

looking up a collateral parameter from a table,

30 and in which the loss length statistic is determined also from the collateral parameter.

64. The method of claim 63, in which

the collateral parameter is a residual bandwidth.

65. The method of claim 55, further comprising:
determining a loss length statistic for a second node about packets discarded at
the second node.

5 66. The method of claim 65, further comprising:
comparing the loss length statistic for the second node to that of the first node.

67. The method of claim 65, further comprising:
comparing the loss length statistic for the second node to a preset minimum.

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68. The method of claim 65, further comprising:
combining the loss length statistic for the second node with the loss length
statistic for the first node to determine an aggregate loss length statistic for a first
path.

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69. The method of claim 68, further comprising:
comparing the aggregate loss length statistic to a preset minimum.

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70. The method of claim 68, further comprising:
determining an aggregate loss length statistic for a second path.

71. The method of claim 70, further comprising:
comparing the aggregate loss length statistic for the second path to that of the
first path.

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72. The method of claim 70, further comprising:
comparing the aggregate loss length statistic for the second path to a preset
minimum.

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